

Serial No.: 09/847,993
Atty. Docket No.: P66599US0

REMARKS

The Office Action mailed May 18, 2005, has been carefully reviewed and Applicant notes with appreciation the identification of allowed subject matter.

By this Amendment, Applicant has amended claims 1-9, 15-25, 31 and 32.

Claims 1-10, 13-26 and 29-36 are pending in the application. Claims 1, 10, 15, 17, 26 and 31 are independent.

The Examiner rejected claims 1-10, 13-26 and 29-36 under 35 U.S.C. 112, first paragraph, as not complying with the written description requirement. While the definition of “significant sidebands” is known to persons of ordinary skill in the art, Applicant has amended the claims herein to remove the basis for this rejection. Favorable reconsideration is requested.

The Examiner rejected claims 1-3, 6-9, 15, 17-19, 22-25 and 31 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-14 of U.S. Patent No. 6,205,184 to Al-Eidan (“the Al-Eidan patent”). The Examiner also rejected claims 16 and 32 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over the Al-Eidan patent in view of U.S. Patent No. 5,200,835 to Sakamoto, and rejected claims 33-36 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over the Al-Eidan patent in view of U.S. Patent No. 4,586,174 to Wong. The Examiner objected to claims 4, 5, 20 and 21 as being dependent on a rejected base claim but stated that claims 4, 5, 20 and 21 would be allowable if rewritten in

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independent form including all of the limitations of the base claim and any intervening claims.

Claims 10, 13, 14, 26, 29 and 30 are allowed.

As clarified in amended claims 1, 15, 17 and 31 presented herein, the present invention is directed to a method and transmitter for communicating via a communication channel. The method includes frequency modulating an information signal with a modulation index M that is not greater than 0.2 *to compress the bandwidth* of an information signal to form a narrow band or very narrow band frequency-modulated carrier signal having a small or very small carrier frequency deviation at the transmitting side of a narrow or very narrow band communication channel and in the communication channel. This narrow band or very narrow band frequency-modulated carrier signal is then *filtered to remove the upper and lower sidebands*. There is thus a compressing followed by a suppressing (through filtering) that is not shown or suggested by the Al-Eidan patent but instead is patentable thereover.

The Examiner stated that the present invention uses a small modulation index to suppress the upper and lower sidebands when, in fact, the present invention uses the small modulation index to *compress the bandwidth*. The use of the small modulation index in both the present invention and in the Al-Eidan patent does not remove the sidebands, as is evident from Figure 3A which depicts the output of a narrow band or very narrow band FM/PM transmitted signal as output by the modulator 120 of Figures 1A and 2. This output from modulator 120 corresponds to the output of the corresponding modulator 120 as implemented in the Al-Eidan patent.

The Examiner then stated that “in using a small modulation index the upper and lower sidebands are reduced which inherently causes suppression of the frequency deviation.” This is not correct. While using a small modulation index does create a small frequency deviation, it does so by compression; the use of a small modulation index *does not suppress* the frequency deviation. If the frequency deviation were suppressed, there would be no information transmitted. This is true because the frequency deviation represents the transmitted information where the number of times per second that the instantaneous frequency varies about the carrier frequency, i.e., the center frequency, is the modulating frequency, while the amount of frequency deviation is proportional to the amplitude of the modulating signal. Thus, if the frequency deviation were suppressed, i.e., removed, there would be nothing intelligent received at the receiver.

Further, if the frequency deviation were suppressed the detector in the FM receiver would not detect any signal. This detector, known as a discriminator, is typically a frequency to voltage converter that senses any frequency change and, in response, produces a voltage output. If the frequency deviation is suppressed, i.e., removed, the discriminator will not sense any frequency change and hence there will be no output from the discriminator.

Thus, the small modulation index, as claimed in the El-Aidan patent and also as included in the present invention, *compresses* the frequency deviation (but does not *suppress* it) and results in an output as shown in Figure 3A. *But this compression does not serve to suppress or remove the sidebands*, as is being claimed by the present invention. *Suppression* of the

sidebands is not the same as compressing of the bandwidth but instead *removes* the sidebands. This removal is accomplished through the further step of filtering the modulator output which results in the modulated carrier signal illustrated in Figure 3B. As shown in Figure 3B, the bandpass filter 135 *removes* the significant upper and lower sidebands of the narrowband/very narrowband FM/PM modulated signal at the transmitting side. All of the transmitted power is thus applied to the transmitted information signal which includes only the instantaneous frequency varied about the carrier frequency such that the maximum bandwidth is only 40% of the modulating frequency. This is not shown or suggested in the Al-Eidan patent. Instead, in the Al-Eidan patent, there are six sidebands such that the bandwidth is 600% of the modulating frequency and the transmitted power is distributed between the information signal and the six sidebands.

In sum, claims 1, 15, 17 and 31 have been amended herein to clarify that the suppression or removal of the sidebands is distinct from the use of the small modulation index to compress the bandwidth. The addition of Sakamoto does not provide teaching to make the present invention obvious either. Sakamoto provides an FM demodulating apparatus circuit which is capable of performing favorable demodulation as applied to recorded FM video signals *in the receiver only* and outside the communication channel or transmission medium. More specifically, Sakamoto is designed to overcome the fluctuations of upper sideband components caused by reproducing heads and the tapes of a video tape recorder (see column 1, lines 35-40). The present invention, by contrast, is directed to audio, video and data FM/PM transmitters and

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receivers in which the upper and lower sidebands are suppressed *in the transmitter*, not in the receiver, and in which the suppression is applied through a live, on-line wireless communication system. Sakamoto does not provide any teaching on the suppression of sidebands prior to transmission, nor the benefits obtained in the resulting application of the transmitted power only to the instantaneous frequency varied about the carrier frequency.

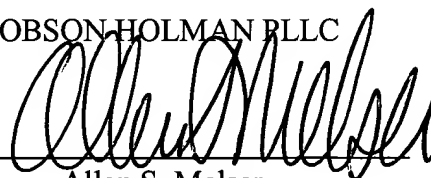
For at least the foregoing reasons, claims 1, 15, 17 and 31 are patentable over the Al-Eidan patent. Favorable reconsideration and allowance thereof is requested. Claims 2-9, 16, 18-25 and 32-36 are also in condition for allowance as claims properly dependent on an allowable base claim. Claims 10, 13, 14, 26, 29 and 30 are allowed.

The foregoing amendments are presented as clarifying in nature and, since they place the application into condition for allowance, are proper after Final Action. Entry thereof is respectfully requested. Should the Examiner have any questions or comments, the Examiner is cordially invited to telephone the undersigned attorney so that the present application can receive an early Notice of Allowance.

Respectfully submitted,

JACOBSON HOLMAN PLLC

By



Allen S. Melser

Reg. No. 27,215

400 Seventh Street, NW
Washington, D.C. 20004-2201
Telephone: (202) 638-6666
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